CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Utility Provided

Georgetown Divide Public Utility District: **0910013:** Calendar 2016

Water Audit & Water Loss Improvement Steps:

going through a Prop 218 now so we will be able to afford to start making changes to our system next year.

<<Information to be completed by Utility>>

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Darrell Creeks	Operations Manager		9/28/17
Executive Name (Print)	Executive Position	Signature	Date

American Water Works Association
California-Nevada Section

CA-NV AWWA Water Loss Technical Assistance Program

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Audit Information:

Utility: Georgetown Divide Public Utility District PWS ID: 0910013

System Type: Potable Audit Period: Calendar 2016

Utility Representation: Martin Ceirante (WTP Operator), Darrell Creeks (Operations Manager), Becky Siren (Consultant)

Validation Date: 7/10/2017 Call Time: 12:30pm Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 50 Data Validity Band (Level): Band II (26-50)

ILI: 1.04 Real Loss: 802.33 (gal/mile-main/day) Apparent Loss: 34.61 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 7.2

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Validator Information:

Water Audit Validator: Drew Blackwell / Jeff Cappadona (support) Validator Qualifications: Contractor for CA-NV AWWA Water Loss TAP

WSO CAVANAUGH Stewardship Through Innovation

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
1	Volume from Own Sources	VOS	3	Supply meter profile: Confirmed all own sources. 20,000 acre-foot supply in reservoir from rainfall and snowmelt feeds to 2 treatment plants. Finished Water Meter (FWM) tracked daily via manual log sheet. 1 FWM at Walton Treatment Plant and 2 FWMs at Autumn Lakes Trail with totalizer. VOS input derived from: Manual reads from production meters as archived. Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.	Percent of own supply metered: 100% Signal calibration frequency: None. Volumetric testing frequency: None. Volumetric testing method: N/A. Percent of own supply volumetrically tested: N/A. Comments: No additional comments.
2	VOS Master Meter & Supply Error Adjustment	VOS MMSEA	3	Input derivation: Left blank in absence of available test data. Net storage change included in MMSEA input: No. Comments: No additional comments.	Supply meter read frequency: Daily. Supply meter read method: Manual. Frequency of data review for trends & anomalies: Each business day. Storage levels monitored in real-time: Yes. Comments: No additional comments.
3	Water Imported	WI	n/a	Comments: No emergency interties exist.	
4	WI Master Meter & Supply Error Adjustment	WI MMSEA	n/a		
5	Water Exported	WE	n/a	Comments: No emergency interties exist.	
6	WE Master Meter & Supply Error Adjustment	WE MMSEA	n/a		
7	Billed metered	BMAC	5	Customer meter profile: Age profile: Average 20 years old. Reading system: Manual. Read frequency: Bi-monthly. Comments: Lag-time correction is not employed in input derivation. Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed. Confirmed that "Billed Construction Water" in SD spreadsheet is metered.	Percent of customers metered: 100% Small meter testing policy: Reactive - complaint based or flagged-consumption testing only. Number of small meters tested/year: 0 Large meter testing policy: Reactive - complaint based or flagged-consumption testing only. Number of large meters tested/year: 0 Meter replacement policy: Upon failure only. Number of replacements/year: 0

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
					Billing data auditing: Standard billing QC, plus review of volumes by use type each billing cycle. Financial auditor performs sampling review on select accounts each year. Comments: No additional comments.
8	Billed unmetered	BUAC	n/a		
9	Unbilled metered	UMAC	n/a	Comments: Confirmed no accounts in this category. All District facilities are either billed or are unmetered.	
10	Unbilled unmetered	UUAC	6	Profile: Operational flushing and fire department usage. Time/flow estimate tracked on spreadsheet by distribution crew. Estimated volumes based on average facility usage No information from fire department. Comments: Although estimated tracking volume does not account for all UUAC, own volume is greater than custom CA default of 0.25% of Water Supplied. Applied estimated volume used at GDPUD facilities.	Comments: No additional comments.
11	Unauthorized consumption	UC	5	Comments: Default input applied.	Comments: Default grade applied.
12	Customer metering inaccuracies	CMI	4	See BMAC comments regarding meter testing & replacement activities. Input derivation: Calculated as simple average from analysis of field data. Simple average applied from 2014 Meter Study provided was over 10%, so applied 9.99% in audit, based on testing roughly 20 meters. It is noted that this study's results should be considered preliminary based on the limited scale of testing conducted. It would be highly unusual for a true average inaccuracy for full meter population to be greater than 10%. Comments: Estimate of customer meters under reporting based on a very limited field accuracy study.	Characterization of meter testing: Limited (upon request AND consumption flag only). Characterization of meter replacement: Limited (upon failure only). Comments: No additional comments.
13	Systematic data handling errors	SDHE	5	Comments: Default input applied.	Comments: Default grade applied.
14	Length of mains	Lm	5	Input derivation: Distance came from consultant. Very little new growth in community (less than 1% in existing subdivisions, but all new lots developed are already served by distribution mains). Hydrant leads included: Yes. Comments: No additional comments.	Mapping format: Digital (GIS). Asset management database: Not currently in place. Map updates & field validation: Accomplished through normal work order processes. Comments: DVG based on no asset management system.

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
15	Number of service connections	Ns	10	Input derivation: Standard report run from billing system. Basis for database query: Meter ID - non-premise based. Comments: Number comes directly from billing software based on accounts (confirmed active and inactive). Accounts are meter-based (all meters in system have an account). There are accounts for properties undeveloped.	CIS updates & field validation: Accomplished through normal meter reading processes. Estimated error of total count within: 1%. Comments: No additional comments.
16	Ave length of cust. service line	Lp	10	Comments: Default input and grade applied, as customer meters are typically located at the property boundary given California climate.	
17	Average operating pressure	AOP	2	Number of zones, general profile: 8 Pressure zones and 50 pressure reducing stations. Typical pressure range: 5 psi to 135 psi. Input derivation: Rudimentary estimate. Comments: 80 psi is a best guess. Large elevation changes throughout district. Customers range from 5 psi to 135 psi. GIS data may include elevation on hydrants, so calculations may be possible to get more accurate input. Existing inventory of PRVs and locations. Average operating pressure not changed now, but may be changed based on GIS data.	Extent of static pressure data collection: Not collected currently. Characterization of real-time pressure data collection: No real-time monitoring currently in place. Hydraulic model: One exists but has not been calibrated within the last 5 years. Comments: No additional comments.
18	Total annual operating cost	TAOC	10	Input derivation: From official financial reports. Comments: Confirmed costs limited to water only, and water debt service included.	Frequency of internal auditing: Annually. Frequency of third-party CPA auditing: Annually. Comments: No additional comments.
19	Customer retail unit cost	CRUC	8	Input derivation: Total consumptive revenue divided by Billed Metered Authorized Consumption. Sewer charges are not based on water meter readings. Sewer revenues are not applicable. Comments: Includes base charges; not possible to separate out the base charges in billing system. Base charge is 2,000 cf (14,960 gallons) for a two-month period, which is rarely exceeded.	Characterization of calculation: Weighted average composite of all rates. Input calculations have not been reviewed by an M36 water loss expert. Comments: No additional comments.
20	Variable production cost	VPC	5	Supply profile: Own sources only. Primary costs included: Treatment chemicals and supply & distribution power. Secondary costs included: None currently included.	Characterization of calculation: Primary costs only. Input calculations have not been reviewed by an M36 water loss expert. Comments: No additional comments.

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
				Comments: No additional comments.	

Key Audit Metrics

(~) VALIDITY Data Validity Score: 50 Data Validity Band (Level): Band II (26-50)

(#) VOLUME ILI: 1.04 Real Loss: 802.44 (gal/mile-main/day) Apparent Loss: 34.61 (gal/conn/day)

($) VALUE Annual Cost of Apparent Losses: $180,270 Annual Cost of Real Losses: $19,579

Infrastructure & Water Loss Management Practices:

Infrastructure age profile: 30-40 years old. Infrastructure replacement policy (current, historic):Replace as needed. Working on a CIP for the future.

Estimated main failures/year: 15 Estimated service failures/year: 96

Extent of proactive leakage management: None.

Other water loss management comments: Leak detection equipment has been purchased to use as necessary, particularly in determined high leakage areas.

Comments on Audit Metrics & Validity Improvements

The Infrastructure Leakage Index (ILI) of 1.04 describes a system that experiences leakage at 1.04 times the modeled technical minimum for its system characteristics.

The Data Validity Score falling within Band II (26-50) indicates that next steps should be generally focused on improving data reliability. Opportunities to improve the reliability of audit inputs and outputs include:

- Improved understanding of Supply Meter (Own or Import) Master Meter Error: consider adopting or increasing the rigor of a source meter volumetric testing and calibration program, informed by the guidance provided in AWWA Manual M36 – Appendix A.
- Temporal alignment of Billed Metered Authorized Consumption with Water Supplied: consider pro-rating the first and last months of the audit period to better align consumption with actual dates of use, and using read date as basis for reporting.
- Improved estimation of CMI: consider a customer meter testing program which tests a sample of random meters whose stratification (by size, age, or other characteristics) represents the entire customer meter stock.

When the CA-NV AWWA Water Audit Validator (WAV) program comes online after this year, is the utility planning on having a staff member become certified to perform the Level 1 Validation for future audits? Yes.